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ZOOLOGY.

Preservation of Color in Animals in a Collection.—M. Richard Thorna, of Dorpat, Russia, believes that he has discovered a liquid that will preserve the natural color of zoological specimens. After washing, the animal is to be preserved in the following solution :

Sulphate of soda	100 grams.
Chloride of sodium	100 “
Chlorate of potash	100 “
Nitrate of potash	10 “
Water	1 litre.

The specimen must remain in the liquid from eighteen to twenty-four hours, after which it is to be put in alcohol, which must be changed once or twice. Animals so treated will keep their color, the tints of which will be slightly deepened. (*Revue Scientifique*, 27 June, 1891.)

The Structure of *Serpula*.—Mr. A. L. Treadwell describes¹ some points in the structure of the New England *Serpula dianthus*. He first points out that Professor Verrill in his original description has confounded dorsal and ventral surfaces in this worm, and then proceeds to describe the general structure of hypodermis, nervous system, tubiparous glands, and sex products. The digestive, muscular, and circulatory apparatus, etc., are much like those in *Spirographis*, described by Claparède, and hence are omitted. Most noticeable is the nervous system, in which the œsophageal commissures are double, the upper commissure on each side being almost entirely composed of nerve-cells. The much convoluted tubiparous glands lie in the first body segment, and extend backwards to about the middle of the second segment.

Metamerism in Hexapods.—As a result of studies on the embryology of the cockroach, Professor Aug. Lameere, has arrived at the following conclusions :² The order of succession of the mouth parts as given by Savigny is accepted. In the head four pairs of cœlomic cavities are recognized, plus a median unpaired cavity, corresponding to the labrum which the author would homologize with the cavity of the anterior directions of the Actinozoa. The antennulæ of the Crus-

¹ *Zool. Anz.*, XIV., 200, 1891.

² *Bull. Soc. Micros., Belg.*, XVII, 1891.

tacea and the cheliceres of the Arachnids are homologous with the antennæ of the Hexapods. The editor of the NATURALIST has reasons for believing that as soon as we know anything about the embryology of the Thysanures, many points in Hexapod morphology and in the relationships of the various Arthropod groups will receive a flood of light.

Cottus beldingii, sp. nov.³—In October, 1889, Mr. L. Belding obtained three specimens of a species of *Cottus* in Lake Tahoe, California. During June, 1890, we obtained a much larger number at the same place. A series of these was sent to the British Museum. The rest are in the collections of the California Academy of Sciences, No. 504. Mr. Belding's specimens are also in the collections of the Academy, No. 702. We also obtained a number from Donner Lake, California, No. 505, California Academy of Sciences.

These specimens represent a variety or species distinct from the Alaskan *Cottus minutus*,⁴ with which it is most closely related.

Head $2\frac{3}{4}$ –4; depth 4–5; D. VI.–VIII. $15\frac{1}{2}$ –18; A. 11–13; V. I. 4.

Head rather short and broad, the profile convex, more steep from eye forward; eye large, orbit 4–5 in head; interorbital concave, 2 in orbit; mouth large; maxillary reaching at least to below the pupil, about 2 in the head. Preopercle with a simple, backward-directed spine, very slightly curved upwards. Teeth on jaws and vomer, none on palatines. Skin smooth. Pectorals reaching vent, or further in young; ventrals $1\frac{1}{3}$ –2 in head. Distance of anal from caudal $1\frac{1}{3}$ in its distance from snout. Anus nearer insertion of caudal than to end of snout. Mottled with black and white. About six blackish cross-bars on back; the first across head just behind eyes, next at origin of dorsal. First dorsal tinged with rust, the second less so. All the fins except the ventrals spotted with dark. The ground color varies greatly with the bottom over which these fishes live.

The other species found at Lake Tahoe were *Phoxinus montanus* Cope, *Agosia oscula* Girard, *Algansea obesa* Girard, *Coregonus williamsoni* Girard, *Catostomus tahoensis* Gill and Jordan; *Salmo mykiss henshawi* Gill and Jordan. Besides these we obtained *Algansea olivacea* Cope, from Donner Lake.—C. H. AND R. S. EIGENMANN.

³ We have lately examined series of specimens belonging to the Academy of Sciences which makes it quite certain that *Cottus gulosus* Girard is identical with *Cottus asper* Richardson.

⁴ Dr. Jordan tells us the name *Cottus minutus* is preoccupied, and not available for the Alaskan species.

A New Diodont.—The fishermen at San Pedro during the past summer took a species of *Chilomycterus* which is the first that has been recorded from the Pacific coast of America. On account of the unreasonable price asked for it I did not obtain it, but took the following notes, which may serve to identify another specimen :

CHILOMYCTERUS CALIFORNIENSIS, sp. nov.—One specimen, $9\frac{7}{8}$ in., San Pedro, California, July, 1891. No tentacles anywhere. Spines of back all low, those of front especially so, increasing in size towards belly, where they become much larger than those of the back. No spine on middle of forehead. A spine at upper anterior angle of orbit ; one above, somewhat behind its middle ; one slightly behind and above its upper posterior angle ; another halfway between the last and the upper angle of pectoral ; and another before and a little above the upper margin of the pectoral. Blue above, white below. Forehead and bases of all the fins with small ($\frac{1}{16}$ in.) dark spots, fewer on anal. Back densely covered with short streaks or bars, which become larger spots on sides. A few round, dark spots ($\frac{1}{4}$ in. in diameter) on belly. Spots below eye larger than those on forehead, similar in size to those of caudal peduncle.—C. H. EIGENMANN, *Bloomington, Ind., Oct. 8th, 1891.*

Temperature and the Number of Vertebræ in Fishes.—

Dr. Jordan's recent paper⁵ on this subject possesses considerable interest. He shows by a review of the known facts that in those groups of fishes which have representatives in the tropics and in colder waters as a rule those species which come from the warmer waters the number of vertebræ is less than in the colder water relatives, a law which was first brought out by Dr. Gill. Dr. Jordan has collated a large number of facts, all bearing on this subject. It may be suggested that the same influences which cause this diversity have possibly given rise to the change of shape in the same species of mollusc as brought out by Prof. E. S. Morse.

Note on *Gyrinophilus maculicaudus* Cope.—In the year 1889 Mr. A. W. Butler, of Brookville, Indiana, presented to Prof. E. D. Cope some specimens of a tailed batrachian that had been taken near the town named, in Southeastern Indiana. They had been collected, I believe, by Mr. E. W. Quick, and had been suspected by both Mr. Butler and Mr. Quick to be an undescribed species related to *Spelerpes longicaudus*, which they greatly resembled. Prof. Cope's practiced eye immediately perceived that they were not members of the

⁵ Proc. U. S. Nat. Mus., XIV., p. 107, 1891.

species named, and the results of his examination of the specimens were published in the AMERICAN NATURALIST, Vol. XXIV., page 967. Prof. Cope named the species *Gyrinophilus maculicaudus*, assigning it to this genus because he found the premaxillaries distinct, instead of being anchylosed, as they are in *Spelerpes*. The species is otherwise distinguished from *Spelerpes longicaudus* by having a broader, flatter head; differently disposed vomerine teeth; by a ground color of vermillion; and by a different arrangement of the black spots. The limbs are also longer than those of *S. longicaudus*.

I have had opportunities to examine several specimens, both living and alcoholic, of this beautiful species. Some of these have come to me from Brookville through the kindness of Messrs. Butler and Quick. Two others had been taken in the vicinity of Bloomington, Indiana, by Prof. B. W. Evermann, of the State Normal School. After making a careful examination of the premaxillaries of several specimens of *maculicaudus* and comparing them with those of *longicaudus*, I am compelled to differ from Prof. Cope as to the generic position of this animal. In the case of all the specimens that I have dissected, except one, I find the premaxillaries to be consolidated. I have taken the premaxillaries out, dried them, and examined them with a sufficiently high power of the compound microscope, without perceiving any evidences of a suture between them. I can see but slight differences between the premaxillaries of it and *S. longicaudus*. In *Gyrinophilus* the premaxillaries are easily separated. In the case of the exceptional specimen mentioned above, the premaxillaries had been broken by accident just a little to one side of the middle line. Had the fracture been exactly in the middle line, I should have concluded that in this specimen the two bones had not united. This suggests that possibly an accident had happened to the specimen examined by Prof. Cope. If, however, Prof. Cope's specimen really had the premaxillaries distinct, while in mine they are anchylosed, the genus *Gyrinophilus* cannot stand. In any case, the species will, according to my view, have to bear the name *Spelerpes maculicaudus*.

This animal is regarded by those who have observed it in its native haunts to be more aquatic in its habits than is *S. longicaudus*. The ones that I kept for some time in a small aquarium showed a disposition to remain out of the water. They would often climb up on the perpendicular glass wall of the aquarium above the water, and rest there for a long time. If, when thus adhering to the glass, this was turned in a horizontal position, they would continue to stick to the under side

of it. I was not successful in my endeavors to get them to eat while in confinement. They appear to endure imprisonment well.

During the summer of the present year my son, W. P. Hay, secured two additional specimens of this cave salamander in the region about Bloomington. One of these was taken in May's Cave, about five miles south of Bloomington and a mile west of Clear Creek Station. It was found sticking to the wall of the cave, about four feet above the water and about one hundred yards from the cave's mouth. The other was captured in Kern's Cave, one mile southwest of Bedford, in Lawrence county. This locality is twenty miles south of May's Cave, and both are about a hundred miles west of Brookville, the original place of the discovery of the species. This shows that the animal is pretty well distributed throughout the southern portion of Indiana, and will probably occur also in the caverns of Kentucky. The specimen taken in Kern's Cave was also found clinging to the wall above the water, and at a distance of about a quarter of a mile from the entrance. Neither of the specimens made any effort to escape capture. Attention was attracted to both by the gleaming of their eyes in the candle-light.

—O. P. HAY.

Color Patterns in Cnemidophorus.—At the last meeting of the American Association for the Advancement of Science I read a paper on the color variations in two species of the above-named genus of lizards, the *C. gularis* B. & G. and *C. tessellatus* Say. In the young of both species the color consists of longitudinal stripes, six in the former and four in the latter, which has a lateral series of spots in place of the external stripes. This coloration is permanent in some of the *C. gularis* and in the *C. t. gracilis*. In both species can be traced an identical series of color varieties, which have especial geographical ranges, and which have mostly received names as species. The first modification is seen in the appearance of pale spots in the interval between the stripes, a character which partly defines the *C. gularis* B. & G. These spots are greatly enlarged in the *C. gularis scalaris* Cope, joining the stripes and breaking up the ground color into spots. On the other hand, the stripes may also be broken up into spots, producing a light-spotted form, the *C. g. communis* Cope. Returning to *C. g. scalaris*, the dark spots may be confluent transversely, forming a transversely banded form. This transverse banding commences at the posterior extremity of the body. When it is restricted to this region and the anterior color pattern disappears, we have the

C. g. costatus Cope. When the color pattern consists of rows of oblong black spots on a dark ground the form *C. g. semifasciatus* Cope is produced.

We have the following results : 1. A longitudinally striped pattern passes into a transversely banded form, etc. 2. This series of changes is common to both species, *C. gularis* and *C. tessellatus*. 3. This series and some of the other variations are found in the *Lacerta muralis* of Southern Europe, as described by Eimer. 4. This kind of variation is not promiscuous or multifarious, but in series.—E. D. COPE.

A Rorqual on the New Jersey Coast.—A young specimen of Balænoptera came ashore at Ocean City, Cape May county, N. J., recently, and was secured for the Academy of Natural Sciences of Philadelphia by the efforts of Prof. A. Heilprin, Dr. S. G. Dixon, and Mr. J. I. Ives. It had been dead for a considerable time, and had lost its whalebone. Its long maceration rendered it possible to procure the skeleton in very good condition. It measured in the flesh 66 feet 11 inches in length ; head to angle of mouth on curve, 16 feet 10 inches. The entire surface was of a purplish slate color, mottled with large blotches of a lighter tint ; under surface of flippers, white. The characters of the skeleton are those of the *B. musculus*, with certain important exceptions, in which it resembles the *B. sibbaldii*. These are the enclosure of the vertebrarterial canal in the axis vertebra only ; the large size, and the color. A full description of it will be published in the Proceedings of the Philadelphia Academy.—E. D. COPE.

New Mammals.—In *North American Fauna*, No. 5, Dr. C. Hart Merriam describes the vertebrate fauna of Southern Idaho. First is a general review of the region and its faunal provinces, and then follow annotated lists of species. Of mammals sixty-seven species are recognized, the following being new : *Sorex idahoënsis*, *S. dobsoni*, *S. vagrans similis*, *Onchomys leucogaster brevicaudus*, *Hesperomys crinitus*, *Arvicola macropus*, *A. mordax*, *A. nanus*, *Phenacomys orophilus*, *Evotomys idahoënsis*, *Thomomys clusius fuscus*, *Lepus idahoënsis*. The only new bird found was *Megascops flammeolus idahoënsis*, which is given a colored plate. The reptiles and Batrachia are catalogued by Dr. L. Stejneger, but embrace no novelties. In the same number Dr. Merriam also describes *Microdipodopus* [n. g.] *megacephalus* from Nevada, and *Evotomys gapperi brevicaudus* from the Black Hills.

Zoological News.—M. Aug. Lameeré, professor in the University of Brussels, has published ⁶ a very readable paper on the "Origin of the Vertebrates." He defends and amplifies Sedgwick's well-known hypothesis, and like him derives the vertebrates, and by implication metamerism, from the Actinozoa.

C. Dwight Marsh publishes ⁷ a list of the deeper water Crustacea in Green Lake, Wis. He enumerates fourteen species, of which a *Bosmina* is new and *Diaptomus minutus* was before known only from Newfoundland.

EMBRYOLOGY.¹

A New Larval Form from Jamaica.—The Marine Laboratory of the Johns Hopkins University was situated during the summer of 1891 on the Island of Jamaica, at a point on Kingston Harbor called Port Henderson. While a member of the party I obtained the larva described below. On the morning of June 24th, while examining the tow-stuff from the surface net, Mr. Charles Taylor, of Kingston, discovered the larva. He made a careful sketch of it from the living animal, and it is from this largely that the accompanying figure was subsequently made. The larva was turned over to me, but unfortunately on account of its minute size it was lost during the hardening process, so that all opportunity of a later and fuller examination is gone. Nevertheless, as I am quite sure the figure is accurate as far as it goes, and as the chance of finding another larva is not very good, I have decided to figure it, with a brief account of its capture.

Although there is no record as to the time in the morning when the tow was made, yet in all probability it was between the hours of six and nine A.M. About six or seven o'clock the land breeze that had been blowing during the night ceased, and there was generally a calm interval of an hour or two before the sea breeze (the trade) forced it way

⁶ Bulletin Société Belge de Microscopie, XVII., 1891.

⁷ Zool. Anzeiger, XIV., 275, 1891.

¹ Edited by Dr. T. H. Morgan, Bryn Mawr College, Bryn Mawr, Pa.

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